freezing degree days were accumulated between January 13 and February 6, but no significant change was observed in the soil temperature at any of the observed levels. The data from December 8–15 show that with temperatures of the soil at above freezing, the soil temperatures continued to fall after the ground was covered with snow, until frost penetrated the upper levels of soil. It seems reasonable that with soil temperatures above 32° F. there should be a continued lowering of these temperatures until an equilibrium condition is established with the snow cover. The depth that the 32° F. isotherm will penetrate is dependent upon moisture content of the soil, soil type and compaction, ground slope, the insulating cover of snow or vegetation, and the ambient air temperatures.

6. CONCLUSIONS

The floods in the Utah-Nevada area in February 1962 were the result of several factors. The first of these was the near-record precipitation during early fall, which increased the soil moisture to above normal amounts. Subsequent temperatures averaged well below normal and with only intermittent snow cover at lower elevations, from 5,000 to 6,000 feet, frost penetration reached near record depths at these elevations by the middle of January.

During the latter half of January, considerable snow fell on the frozen ground. The water equivalent of this snow cover was retained on the ground as a result of the below-normal temperatures and heavy fog which covered most of the intermountain area during the latter part of January and early February. The warming trend during the second week of February with high dew points rapidly melted the snow pack and this coupled with heavy rains made considerable water available for runoff. The latent heat released by this condensation would have been available for melting and ripening of the snow pack.

The most significant single factor contributing to the floods was the depth to which the soil was frozen. If the ground had not been frozen to such depths, it is believed that the available water would not have resulted in nearly the degree of flooding. This is supported by the fact that over an inch of rain occurred during the next week in some of the flood areas when the ground was exceptionally wet but unfrozen, yet no additional flooding was reported.

Additional soil temperature reports from the intermountain area should aid a great deal in forecasting this type of flood condition.

REFERENCE

1. J. C. Alter, "Frost Penetration in Utah", unpublished report Salt Lake City, 1930.

New Weather Bureau Publication

Technical Paper No. 44, "A Catalog of 100 FCC-Positioned Transosonde Flights," by J. K. Angell, Washington, D.C., 1962, 291 pp. For sale by Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C; Price $2.00.

For each flight the data presented consist of a trajectory map and two contour and isotherm maps near the beginning and end of the flight; a tabulation of the time of positioning, location pressure, fix accuracy, wind speed and direction, and derived ageostrophic wind components; and a graph showing variation with time of transosonde-derived wind speed and ageostrophic speed. Flights were made between April 1953 and May 1959, at levels of 300, 250, and 150 mb.